TSG-RAN Meeting #12 *RP-010308*
Stockholm, Sweden, 12 - 15 June 2001

Title: **Agreed CRs (Release '99 and Rel-4 category A) to TS 25.321**

Source: **TSG-RAN WG2**

Agenda item: **8.2.3**

Doc-1st-	Status-	Spec	CR	Rev	Phase	Subject	Cat	Version	Versio
R2-011307	agreed	25.321	073	1	R99	RLC Tr Discard	F	3.7.0	3.8.0
R2-011340	agreed	25.321	074		Rel-4	RLC Tr Discard	A	4.0.0	4.1.0
R2-011308	agreed	25.321	075	1	R99	Clarification on compressed mode	F	3.7.0	3.8.0
R2-011341	agreed	25.321	076		Rel-4	Clarification on compressed mode	A	4.0.0	4.1.0
R2-011309	agreed	25.321	077	1	R99	Correction of relation between MAC functions and transport channels	F	3.7.0	3.8.0
R2-011342	agreed	25.321	078		Rel-4	Correction of relation between MAC functions and transport channels	A	4.0.0	4.1.0
R2-011324	agreed	25.321	079	1	R99	Rate adaptation	F	3.7.0	3.8.0
R2-011343	agreed	25.321	080		Rel-4	Rate adaptation	A	4.0.0	4.1.0
R2-011310	agreed	25.321	081	1	R99	Cleanup of MAC services and functions	F	3.7.0	3.8.0
R2-011344	agreed	25.321	082		Rel-4	Cleanup of MAC services and functions	A	4.0.0	4.1.0

3GPP TSG-RAN WG2 Meeting #21
Pusan, Korea, 21-25 May 2001

Tdoc R2-011307

CR-Form-v3

CHANGE REQUEST

⌘ **25.321 CR 073** ⌘ rev **r1** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	RLC Tr discard
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	2001-05-15
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	The configuration for handling of erroneous SDUs in Tr mode is not reflected in MAC.
Summary of change:	⌘	1. A primitive from MAC to RLC is used to indicate if a received SDU contains detected bit errors. 2. An error case is added stating that MAC PDUc containing errors (indicated from lower layers) shall be discarded if a MAC header is included in the MAC PDU. Backwards compatibility: This CR can be considered as backwards compatible, since it is consistent with current WG2 assumptions, but it needs to be considered in implementation.
Consequences if not approved:	⌘	Unclear behaviour. Configuration made in 24.008 is not reflected in RLC.

Clauses affected:	⌘	8.2.1, 8.2.2, 10
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
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~~4)~~3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

8.2 Primitives between MAC and RLC

8.2.1 Primitives

The primitives between MAC layer and RLC layer are shown in table 8.2.1.1.

Table 8.2.1.1: Primitives between MAC layer and RLC layer

Generic Name	Parameter			
	Request	Indication	Response	Confirm
MAC-DATA	Data, BO, UE-ID type indicator, RLC Entity Info	Data, No_TB, TD (note), Error indication		
MAC-STATUS		No_PDU, PDU_Size, TX status	BO, RLC Entity Info	
NOTE: TDD only.				

MAC-DATA-Req/Ind:

- MAC-DATA-Req primitive is used to request that an upper layer PDU be sent using the procedures for the information transfer service;

- MAC-DATA-Ind primitive indicates the arrival of upper layer PDUs received within one transmission time interval by means of the information transfer service.

MAC-STATUS-Ind/Resp:

- MAC-STATUS-Ind primitive indicates to RLC for each logical channel the rate at which it may transfer data to MAC. Parameters are the number of PDUs that can be transferred in each transmission time interval and the PDU size; it is possible that MAC would use this primitive to indicate that it expects the current buffer occupancy of the addressed logical channel in order to provide for optimised TFC selection on transport channels with long transmission time interval. At the UE, MAC-STATUS-Ind primitive is also used to indicate from MAC to RLC that MAC has requested data transmission by PHY (i.e. PHY-DATA-REQ has been submitted, see Fig. 11.2.2.1), or that transmission of an RLC PDU on RACH or CPCH has failed due to exceeded preamble ramping cycle counter.

- MAC-STATUS-Resp primitive enables RLC to acknowledge a MAC-STATUS-Ind. It is possible that RLC would use this primitive to indicate that it has nothing to send or that it is in a suspended state or to indicate the current buffer occupancy to MAC.

8.2.2 Parameters

a) Data:

   - it contains the RLC layer messages (RLC-PDU) to be transmitted, or the RLC layer messages that have been received by the MAC sub-layer.

b) Number of transmitted transport blocks (No_TB) :

   - indicates the number of transport blocks transmitted by the peer entity within the transmission time interval, based on the TFI value.

c) Buffer Occupancy (BO):

   - the parameter Buffer Occupancy (BO) indicates for each logical channel the amount of data in number of bytes that is available for transmission and retransmission in RLC layer. When MAC is connected to an AM RLC entity, control PDUs to be transmitted and RLC PDUs outside the RLC Tx window shall also be included in the BO. RLC PDUs that have been transmitted but not negatively acknowledged by the peer entity shall not be included in the BO.

d) RX Timing Deviation (TD), TDD only:

- it contains the RX Timing Deviation as measured by the physical layer for the physical resources carrying the data of the Message Unit. This parameter is optional and only for Indication. It is needed for the transfer of the RX Timing Deviation measurement of RACH transmissions carrying CCCH data to RRC.

e) Number of PDU (No_PDU):

- specifies the number of PDUs that the RLC is permitted to transfer to MAC within a transmission time interval.

f) PDU Size (PDU_Size):

- specifies the size of PDU that can be transferred to MAC within a transmission time interval.

g) UE-ID Type Indicator:

- indicates the UE-ID type to be included on MAC for a DCCH when it is mapped onto a common transport channel (i.e. FACH, RACH or CPCH).

h) TX status:

- when set to value "transmission unsuccessful" this parameter indicates to RLC that transmission of an RLC PDU failed in the previous Transmission Time Interval, when set to value "transmission successful" this parameter indicates to RLC that the requested RLC PDU(s) has been submitted for transmission by the physical layer.

i) RLC Entity Info

- indicates to MAC the configuration parameters which are critical to TFC selection depending on its mode and the amount of data that could be transmitted at the next TTI. This primitive is meant to insure that MAC can perform TFC selection (see subclause 11.4).

j) Error indication

- When a MAC SPDU is delivered to ~~higher~~upper layer, an error indication is given for the SPDU to upper layer if an error indication for the SPDU has been received from lower layer.

10 Handling of unknown, unforeseen and erroneous protocol data

The list of error cases is reported below:

a) Use of reserved coding in the MAC header

If the MAC entity receives a Data PDU with a header field using a value marked as reserved for this version of the protocol, it shall discard the PDU, unless explicitly mentioned otherwise.

b) Inconsistent MAC header

If the MAC entity receives a data PDU with a header inconsistent with the configuration received from RRC, it shall discard the PDU. E.g.: In case DTCH is mapped to RACH/FACH, the MAC entity shall discard a PDU with a C/T field indicating a logical channel number that is not configured.

c) Erroneous MAC header fields

The MAC PDU shall be discarded if the lower layer gives an error indication for a MAC PDU and a MAC header is included in the MAC PDU.

3GPP TSG-RAN WG2 Meeting #21
Pusan, Korea, 21-25 May 2001

Tdoc R2-011340

CR-Form-v3

CHANGE REQUEST

⌘ **25.321** **CR** **074** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	RLC Tr discard
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	2001-05-25
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
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Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	The configuration for handling of erroneous SDUs in Tr mode is not reflected in MAC.
Summary of change:	⌘	1. A primitive from MAC to RLC is used to indicate if a received SDU contains detected bit errors. 2. An error case is added stating that MAC PDUc containing errors (indicated from lower layers) shall be discarded if a MAC header is included in the MAC PDU.
Consequences if not approved:	⌘	Unclear behaviour. Configuration made in 24.008 is not reflected in RLC.

Clauses affected:	⌘	8.2.1, 8.2.2, 10		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

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NOTE: TDD only.				

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MAC-STATUS-Ind/Resp:

- MAC-STATUS-Ind primitive indicates to RLC for each logical channel the rate at which it may transfer data to MAC. Parameters are the number of PDUs that can be transferred in each transmission time interval and the PDU size; it is possible that MAC would use this primitive to indicate that it expects the current buffer occupancy of the addressed logical channel in order to provide for optimised TFC selection on transport channels with long transmission time interval. At the UE, MAC-STATUS-Ind primitive is also used to indicate from MAC to RLC that MAC has requested data transmission by PHY (i.e. PHY-DATA-REQ has been submitted, see Fig. 11.2.2.1), or that transmission of an RLC PDU on RACH or CPCH has failed due to exceeded preamble ramping cycle counter.

- MAC-STATUS-Resp primitive enables RLC to acknowledge a MAC-STATUS-Ind. It is possible that RLC would use this primitive to indicate that it has nothing to send or that it is in a suspended state or to indicate the current buffer occupancy to MAC.

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c) Buffer Occupancy (BO):

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d) RX Timing Deviation (TD), TDD only:

- it contains the RX Timing Deviation as measured by the physical layer for the physical resources carrying the data of the Message Unit. This parameter is optional and only for Indication. It is needed for the transfer of the RX Timing Deviation measurement of RACH transmissions carrying CCCH data to RRC.

e) Number of PDU (No_PDU):

- specifies the number of PDUs that the RLC is permitted to transfer to MAC within a transmission time interval.

f) PDU Size (PDU_Size):

- specifies the size of PDU that can be transferred to MAC within a transmission time interval.

g) UE-ID Type Indicator:

- indicates the UE-ID type to be included on MAC for a DCCH when it is mapped onto a common transport channel (i.e. FACH, RACH or CPCH).

h) TX status:

- when set to value "transmission unsuccessful" this parameter indicates to RLC that transmission of an RLC PDU failed in the previous Transmission Time Interval, when set to value "transmission successful" this parameter indicates to RLC that the requested RLC PDU(s) has been submitted for transmission by the physical layer.

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- indicates to MAC the configuration parameters which are critical to TFC selection depending on its mode and the amount of data that could be transmitted at the next TTI. This primitive is meant to insure that MAC can perform TFC selection (see subclause 11.4).

j) Error indication

- When a MAC SPDU is delivered to ~~higher~~upper layer, an error indication is given for the SPDU to upper layer if an error indication for the SPDU has been received from lower layer.

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c) Erroneous MAC header fields

The MAC PDU shall be discarded if the lower layer gives an error indication for a MAC PDU and a MAC header is included in the MAC PDU.

3GPP TSG-RAN WG2 Meeting #21
Pusan, Korea, 21-25 May 2001

Tdoc R2-011308

CR-Form-v3

CHANGE REQUEST

⌘ **25.321** **CR** **075** ⌘ rev **r1** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Clarification on compressed mode
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	2001-05-15
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	It is not clearly stated that the TFC selection shall consider compressed mode.
Summary of change:	⌘	It is clarified that a selected TFC shall not carry more bits than can be transmitted in a TTI. This is important when the number of bits that can be transmitted in a TTI is reduced due to compressed frames using higher layer scheduling. **Backwards compatibly analysis**: This CR can be considered backwards compatible since it is in line with current WG2 assumptions but need to be considered in an implementation.
Consequences if not approved:	⌘	Risk for erroneous implementation regarding compressed mode.

Clauses affected:	⌘	11.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

11.4 Transport format combination selection in UE

RRC can control the scheduling of uplink data by giving a priority value between 1 and 8 for each logical channel where 1 is the highest priority and 8 the lowest. The selection of TFC in the UE shall be done according to the priorities between logical channels indicated by RRC. Logical channels have absolute priority i.e. the UE shall maximize the transmission of high priority data.

The scheme is performed each time a TFC selection is performed, i.e., each time the shortest configured TTI begins.

Each time the TFC selection is performed, the UE shall estimate which TFCs that can be supported. If the estimated power needed for a TFC is greater than the maximum UE transmitter power [7], the TFC shall not be used in the TFC selection algorithm below. The requirements for the estimation of supported TFCs are described in [12].

Before selecting a TFC, the set of valid TFCs will be established. All TFCs in the set of valid TFCs shall:

1. belong to the TFCS.
2. be supported by the maximum UE transmitter power as defined above.
3. be compatible with the RLC configuration.
4. not require RLC to produce padding PDUs (see [6] for definition).
5. not carry more bits than~~t~~ can be transmitted in a TTI (e.g. when the number of bits that can be transmitted in a TTI is reduced due to compressed frames when compressed mode by higher layer scheduling is used).

If the TFCS selected by UTRAN does not follow the guidelines specified in [7] the UE may ignore ~~the last~~ constraint number 4 mentioned above in determining the set of valid TFCs.

The chosen TFC shall be selected from within the set of valid TFCs and shall satisfy the following criteria in the order in which they are listed below:

1. No other TFC shall allow the transmission of more highest priority data than the chosen TFC.
2. No other TFC shall allow the transmission of more data from the next lower priority logical channels. Apply this criterion recursively for the remaining priority levels.
3. No other TFC shall have a lower bit rate than the chosen TFC.

The above rules for TFC selection in the UE shall apply to DCH, and the same rules shall apply for TF selection on RACH and CPCH.

The maximum UE power is defined in [7].

3GPP TSG-RAN WG2 Meeting #21
Pusan, Korea, 21-25 May 2001

Tdoc R2-011341

CR-Form-v3

CHANGE REQUEST

⌘ **25.321** **CR** **076** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Clarification on compressed mode
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	2001-05-25
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
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Use one of the following releases:

2	*(GSM Phase 2)*
R96	*(Release 1996)*
R97	*(Release 1997)*
R98	*(Release 1998)*
R99	*(Release 1999)*
REL-4	*(Release 4)*
REL-5	*(Release 5)*

Reason for change:	⌘	It is not clearly stated that the TFC selection shall consider compressed mode.
Summary of change:	⌘	It is clarified that a selected TFC shall not carry more bits than can be transmitted in a TTI. This is important when the number of bits that can be transmitted in a TTI is reduced due to compressed frames using higher layer scheduling.
Consequences if not approved:	⌘	Risk for erroneous implementation regarding compressed mode.

Clauses affected:	⌘	11.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

11.4 Transport format combination selection in UE

RRC can control the scheduling of uplink data by giving a priority value between 1 and 8 for each logical channel where 1 is the highest priority and 8 the lowest. The selection of TFC in the UE shall be done according to the priorities between logical channels indicated by RRC. Logical channels have absolute priority i.e. the UE shall maximize the transmission of high priority data.

The scheme is performed each time a TFC selection is performed, i.e., each time the shortest configured TTI begins.

Each time the TFC selection is performed, the UE shall estimate which TFCs that can be supported. If the estimated power needed for a TFC is greater than the maximum UE transmitter power [7], the TFC shall not be used in the TFC selection algorithm below. The requirements for the estimation of supported TFCs are described in [12].

Before selecting a TFC, the set of valid TFCs will be established. All TFCs in the set of valid TFCs shall:

1. belong to the TFCS.
2. be supported by the maximum UE transmitter power as defined above.
3. be compatible with the RLC configuration.
4. not require RLC to produce padding PDUs (see [6] for definition).
5. not carry more bits than~~t~~ can be transmitted in a TTI (e.g. when the number of bits that can be transmitted in a TTI is reduced due to compressed frames when compressed mode by higher layer scheduling is used).

If the TFCS selected by UTRAN does not follow the guidelines specified in [7] the UE may ignore ~~the last~~ constraint number 4 mentioned above in determining the set of valid TFCs.

The chosen TFC shall be selected from within the set of valid TFCs and shall satisfy the following criteria in the order in which they are listed below:

1. No other TFC shall allow the transmission of more highest priority data than the chosen TFC.
2. No other TFC shall allow the transmission of more data from the next lower priority logical channels. Apply this criterion recursively for the remaining priority levels.
3. No other TFC shall have a lower bit rate than the chosen TFC.

The above rules for TFC selection in the UE shall apply to DCH, and the same rules shall apply for TF selection on RACH and CPCH.

The maximum UE power is defined in [7].

3GPP TSG-RAN WG2 #21 **R2-011309**
Busan, Korea, May 21 ~ May 25, 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.321** **CR** **077** ⌘ ev **r1** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Correction of relation between MAC functions and transport channels
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	2001.5.15
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	TF selection for USCH is done by UE MAC not by UTRAN
Summary of change:	⌘	Delete the function of TF selection for USCH in UTRAN side **Backwards compatibility analysis**: TF selection for USCH in UTRAN side seems to be redundant. So to delete the TF selection for USCH in UTRAN side can be as backwards compatible but need to be considered in implementation.
Consequences if not approved:	⌘	

Clauses affected:	⌘	6.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.2 Relation between MAC Functions and Transport Channels

6.2.1 Relation between MAC Functions and Transport Channels in UTRAN

Table 6.2.1.1: UTRAN MAC functions corresponding to the transport channel

Associated MAC Functions	Logical Ch	Transport Ch	TF Selection	Priority handling between users	Priority handling (one user)	Scheduling	Identification of UEs	Mux/ Demux on common transport channels	Mux/ Demux on dedicated transport channels
Uplink (Rx)	CCCH	RACH						X	
	DCCH	RACH					X	X	
	DCCH	CPCH					X	X	
	DCCH	DCH							X
	DTCH	RACH					X	X	
	DTCH	CPCH					X	X	
	DTCH	DCH							X
	SHCCH	RACH					X	X	
	SHCCH	USCH						X	
	DTCH	USCH	~~X~~					X	
	DCCH	USCH	~~X~~					X	
Downlink (Tx)	BCCH	BCH				X			
	BCCH	FACH	X			X		X	
	PCCH	PCH	X			X			
	CCCH	FACH	X	X		X		X	
	CTCH	FACH	X			X		X	
	DCCH	FACH	X	X		X	X	X	
	DCCH	DSCH	X	X				X	
	DCCH	DCH	X		X				X
	DTCH	FACH	X	X		X	X	X	
	DTCH	DSCH	X	X				X	
	DTCH	DCH	X		X				X
	SHCCH	FACH	X	X		X		X	
	SHCCH	DSCH	X	X				X	

3GPP TSG-RAN WG2 #21 **R2-011342**
Busan, Korea, 21 – 25 May, 2001

CR-Form-v4

CHANGE REQUEST

⌘ **25.321** **CR** **078** ⌘ ev **-** ⌘ Current version: **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☐ Radio Access Network **X** Core Network ☐

Title:	⌘	Correction of relation between MAC functions and transport channels
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	2001.5.23
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 *(GSM Phase 2)*
R96 *(Release 1996)*
R97 *(Release 1997)*
R98 *(Release 1998)*
R99 *(Release 1999)*
REL-4 *(Release 4)*
REL-5 *(Release 5)*

Reason for change:	⌘	TF selection for USCH is done by UE MAC not by UTRAN
Summary of change:	⌘	Delete the function of TF selection for USCH in UTRAN side **Backwards compatibility analysis**: TF selection for USCH in UTRAN side seems to be redundant. So to delete the TF selection for USCH in UTRAN side can be as backwards compatible but need to be considered in implementation.
Consequences if not approved:	⌘	

Clauses affected:	⌘	6.2.1
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

6.2 Relation between MAC Functions and Transport Channels

6.2.1 Relation between MAC Functions and Transport Channels in UTRAN

Table 6.2.1.1: UTRAN MAC functions corresponding to the transport channel

Associated MAC Functions	Logical Ch	Transport Ch	TF Selection	Priority handling between users	Priority handling (one user)	Scheduling	Identification of UEs	Mux/ Demux on common transport channels	Mux/ Demux on dedicated transport channels
Uplink (Rx)	CCCH	RACH						X	
	DCCH	RACH					X	X	
	DCCH	CPCH					X	X	
	DCCH	DCH							X
	DTCH	RACH					X	X	
	DTCH	CPCH					X	X	
	DTCH	DCH							X
	SHCCH	RACH					X	X	
	SHCCH	USCH						X	
	DTCH	USCH	~~X~~					X	
	DCCH	USCH	~~X~~					X	
Downlink (Tx)	BCCH	BCH				X			
	BCCH	FACH	X			X		X	
	PCCH	PCH	X			X			
	CCCH	FACH	X	X		X		X	
	CTCH	FACH	X			X		X	
	DCCH	FACH	X	X		X	X	X	
	DCCH	DSCH	X	X				X	
	DCCH	DCH	X		X				X
	DTCH	FACH	X	X		X	X	X	
	DTCH	DSCH	X	X				X	
	DTCH	DCH	X		X				X
	SHCCH	FACH	X	X		X		X	
	SHCCH	DSCH	X	X				X	

3GPP TSG-RAN WG2 Meeting #21
Pusan, Korea, 21-25 May 2001

Tdoc R2-011324

CR-Form-v3

CHANGE REQUEST

⌘ **25.321** **CR** **079** ⌘ rev **r1** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE ☒ Radio Access Network ☐ Core Network ☐

Title:	⌘	Rate adaptation
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	2001-05-15
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	It is currently not mentioned that the source data rate from codecs shall be adapted to the selected TFC.
Summary of change:	⌘	It is clarified that the source data rate from codecs with variable data rate shall be adapted to the selected TFC. **Backwards compatibly analysis**: This is a clarification that is made to avoid erroneous implementation, but can be seen as backwards compatible.
Consequences if not approved:	⌘	Risk for erroneous implementation regarding variable rate codecs (e.g. AMR speech).

Clauses affected:	⌘	11.4		
Other specs affected:	⌘	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	⌘	
Other comments:	⌘			

How to create CRs using this form:
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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

11.4 Transport format combination selection in UE

RRC can control the scheduling of uplink data by giving a priority value between 1 and 8 for each logical channel where 1 is the highest priority and 8 the lowest. The selection of TFC in the UE shall be done according to the priorities between logical channels indicated by RRC. Logical channels have absolute priority i.e. the UE shall maximize the transmission of high priority data.

The scheme is performed each time a TFC selection is performed, i.e., each time the shortest configured TTI begins.

Each time the TFC selection is performed, the UE shall estimate which TFCs that can be supported. If the estimated power needed for a TFC is greater than the maximum UE transmitter power [7], the TFC shall not be used in the TFC selection algorithm below. The requirements for the estimation of supported TFCs are described in [12].

Before selecting a TFC, the set of valid TFCs will be established. All TFCs in the set of valid TFCs shall:

1. belong to the TFCS.
2. be supported by the maximum UE transmitter power as defined above.
3. be compatible with the RLC configuration.
4. not require RLC to produce padding PDUs (see [6] for definition).

If the TFCS selected by UTRAN does not follow the guidelines specified in [7] the UE may ignore the last constraint mentioned above in determining the set of valid TFCs.

The chosen TFC shall be selected from within the set of valid TFCs and shall satisfy the following criteria in the order in which they are listed below:

1. No other TFC shall allow the transmission of more highest priority data than the chosen TFC.
2. No other TFC shall allow the transmission of more data from the next lower priority logical channels. Apply this criterion recursively for the remaining priority levels.
3. No other TFC shall have a lower bit rate than the chosen TFC.

The above rules for TFC selection in the UE shall apply to DCH, and the same rules shall apply for TF selection on RACH and CPCH.

NOTE: Based on the selected TFC, MAC should indicate the available bitrate for each logical channel to upper layers in order to facilitate adaptation of codec data rate when codecs supporting variable-rate operation is used. The details of the interaction with the application layer is not further specified.

The maximum UE power is defined in [7].

3GPP TSG-RAN WG2 Meeting #21
Pusan, Korea, 21-25 May 2001

Tdoc R2-011343

CR-Form-v3

CHANGE REQUEST

⌘ **25.321** **CR** **080** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network ☐ Core Network ☐

Title:	⌘	Rate adaptation
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	2001-05-25
Category:	⌘	**A**
Release:	⌘	R99

Use one of the following categories:
F *(essential correction)*
A *(corresponds to a correction in an earlier release)*
B *(Addition of feature),*
C *(Functional modification of feature)*
D *(Editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change:	⌘	It is currently not mentioned that the source data rate from codecs shall be adapted to the selected TFC.
Summary of change:	⌘	It is clarified that the source data rate from codecs with variable data rate shall be adapted to the selected TFC.
Consequences if not approved:	⌘	Risk for erroneous implementation regarding variable rate codecs (e.g. AMR speech).

Clauses affected:	⌘	11.4
Other specs affected:	⌘	☐ Other core specifications ⌘ ☐ Test specifications ☐ O&M Specifications
Other comments:	⌘	

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

11.4 Transport format combination selection in UE

RRC can control the scheduling of uplink data by giving a priority value between 1 and 8 for each logical channel where 1 is the highest priority and 8 the lowest. The selection of TFC in the UE shall be done according to the priorities between logical channels indicated by RRC. Logical channels have absolute priority i.e. the UE shall maximize the transmission of high priority data.

The scheme is performed each time a TFC selection is performed, i.e., each time the shortest configured TTI begins.

Each time the TFC selection is performed, the UE shall estimate which TFCs that can be supported. If the estimated power needed for a TFC is greater than the maximum UE transmitter power [7], the TFC shall not be used in the TFC selection algorithm below. The requirements for the estimation of supported TFCs are described in [12].

Before selecting a TFC, the set of valid TFCs will be established. All TFCs in the set of valid TFCs shall:

1. belong to the TFCS.
2. be supported by the maximum UE transmitter power as defined above.
3. be compatible with the RLC configuration.
4. not require RLC to produce padding PDUs (see [6] for definition).

If the TFCS selected by UTRAN does not follow the guidelines specified in [7] the UE may ignore the last constraint mentioned above in determining the set of valid TFCs.

The chosen TFC shall be selected from within the set of valid TFCs and shall satisfy the following criteria in the order in which they are listed below:

1. No other TFC shall allow the transmission of more highest priority data than the chosen TFC.
2. No other TFC shall allow the transmission of more data from the next lower priority logical channels. Apply this criterion recursively for the remaining priority levels.
3. No other TFC shall have a lower bit rate than the chosen TFC.

The above rules for TFC selection in the UE shall apply to DCH, and the same rules shall apply for TF selection on RACH and CPCH.

Note: Based on the selected TFC, MAC should indicate the available bitrate for each logical channel to upper layers in order to facilitate adaptation of codec data rate when codecs supporting variable-rate operation is used. The details of the interaction with the application layer is not further specified.

The maximum UE power is defined in [7].

3GPP TSG-RAN WG2 Meeting #21
Busan, Korea, 21 - 25 May 2001

Tdoc R2-011310

CR-Form-v4

CHANGE REQUEST

⌘ **25.321 CR 081** ⌘ rev **r1** ⌘ Current version: **3.7.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Cleanup of MAC services and functions
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	23 May 2001
Category:	⌘	**F**
Release:	⌘	R99

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘
1. 25.321 is not aligned with 25.301.
2. Some of relations between MAC functions and logical/transport channels are not correct.

Summary of change: ⌘
1. The function 'priority handling between data flows of several users on the DSCH and FACH' is removed from MAC functions. It is not present in 25.301, and it is the same function as 'priority handling between UEs by means of dynamic scheduling'.
2. The function 'Identification of UEs' is marked for the DCCH/DSCH and DTCH/DSCH cases. This function is used when dedicated logical channel is mapped to FACH or DSCH.
3. The title of section 11 is changed from 'Elementary procedures' to 'Specific functions'. The contents of this section are also MAC functions.

Backwards compatibility analysis

The CR shall be backwards compatible since no functionality has changed.

Consequences if not approved: ⌘ Misalignment between the specs.

Clauses affected: ⌘ 6.1, 6.2.1, 6.2.2, 11

Other specs Affected: ⌘
☐ Other core specifications ⌘
☐ Test specifications
☐ O&M Specifications

Other comments: ⌘

How to create CRs using this form:

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2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://ftp.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

5 Services provided to upper layers

This clause describes the different services provided by the MAC to higher layers. For a detailed description of the following functions see [2].

5.1 Description of Services provided to upper layers

- Data transfer: This service provides unacknowledged transfer of MAC SDUs between peer MAC entities without data segmentation.
- Reallocation of radio resources and MAC parameters: This service performs on request of RRC execution of radio resource reallocation and change of MAC parameters.
- Reporting of measurements: Local measurements are reported to RRC.

6 Functions

6.1 Description of the MAC functions

The functions of MAC include:

- mapping between logical channels and transport channels;
- selection of appropriate Transport Format for each Transport Channel depending on instantaneous source rate;
- priority handling between data flows of one UE;
- priority handling between UEs by means of dynamic scheduling;
- ~~priority handling between data flows of several users on the DSCH and FACH;~~
- identification of UEs on common transport channels;
- multiplexing/demultiplexing of ~~higher~~upper layer PDUs into/from transport blocks delivered to/from the physical layer on common transport channels;
- multiplexing/demultiplexing of ~~higher~~upper layer PDUs into/from transport block sets delivered to/from the physical layer on dedicated transport channels;
- traffic volume ~~monitoring~~measurement;
- Transport Channel type switching;
- ciphering for transparent mode RLC;
- Access Service Class selection for RACH and CPCH transmission.

6.2 Relation between MAC Functions and Transport Channels

6.2.1 Relation between MAC Functions and Transport Channels in UTRAN

Table 6.2.1.1: UTRAN MAC functions corresponding to the transport channel

Associated MAC Functions	Logical Ch	Transport Ch	TF Selection	Priority handling between ~~users~~UEs	Priority handling (one ~~user~~UE)	Scheduling	Identification of UEs	Mux/ Demux on common transport channels	Mux/ Demux on dedicated transport channels
Uplink (Rx)	CCCH	RACH						X	
	DCCH	RACH					X	X	
	DCCH	CPCH					X	X	
	DCCH	DCH							X
	DTCH	RACH					X	X	
	DTCH	CPCH					X	X	
	DTCH	DCH							X
	SHCCH	RACH					X	X	
	SHCCH	USCH						X	
	DTCH	USCH	X					X	
	DCCH	USCH	X					X	
Downlink (Tx)	BCCH	BCH				X			
	BCCH	FACH	X			X		X	
	PCCH	PCH	X			X			
	CCCH	FACH	X	X		X		X	
	CTCH	FACH	X			X		X	
	DCCH	FACH	X	X		X	X	X	
	DCCH	DSCH	X	X			X	X	
	DCCH	DCH	X		X				X
	DTCH	FACH	X	X		X	X	X	
	DTCH	DSCH	X	X			X	X	
	DTCH	DCH	X		X				X
	SHCCH	FACH	X	X		X		X	
	SHCCH	DSCH	X	X				X	

6.2.2 Relation of MAC Functions and Transport Channels in UE

Table 6.2.2.1: UE MAC functions corresponding to the transport channel

Associated MAC Functions	Logical Ch	Transport Ch	TF Selection	Priority handling ~~data of~~ (one ~~user~~UE)	Identification	Mux/Demux on common transport channels	Mux/Demux on dedicated transport channels
Uplink (Tx)	CCCH	RACH				X	
	DCCH	RACH	X	X	X	X	
	DCCH	CPCH	X	X	X	X	
	DCCH	DCH	X	X			X
	DTCH	RACH	X	X	X	X	
	DTCH	CPCH	X	X	X	X	
	DTCH	DCH	X	X			X
	SHCCH	RACH				X	
	SHCCH	USCH	X	X		X	
	DCCH	USCH	X	X		X	
	DTCH	USCH	X	X		X	
Downlink (Rx)	BCCH	BCH					
	BCCH	FACH				X	
	PCCH	PCH					
	CCCH	FACH				X	
	CTCH	FACH				X	
	DCCH	FACH			X	X	
	DCCH	DSCH				X	
	DCCH	DCH					X
	DTCH	FACH			X	X	
	DTCH	DSCH				X	
	DTCH	DCH					X
	SHCCH	FACH				X	
	SHCCH	DSCH				X	

11 ~~Elementary procedures~~Specific functions

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Busan, Korea, 21 - 25 May 2001

Tdoc R2-011344

CR-Form-v4

CHANGE REQUEST

⌘ **25.321 CR 082** ⌘ rev **-** ⌘ Current version: **4.0.0** ⌘

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.*

Proposed change affects: ⌘ (U)SIM ☐ ME/UE **X** Radio Access Network **X** Core Network ☐

Title:	⌘	Cleanup of MAC services and functions
Source:	⌘	TSG-RAN WG2
Work item code:	⌘	TEI
Date:	⌘	24 May 2001
Category:	⌘	**A**
Release:	⌘	REL-4

Use one of the following categories:
F *(correction)*
A *(corresponds to a correction in an earlier release)*
B *(addition of feature),*
C *(functional modification of feature)*
D *(editorial modification)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.

Use one of the following releases:
2 (GSM Phase 2)
R96 (Release 1996)
R97 (Release 1997)
R98 (Release 1998)
R99 (Release 1999)
REL-4 (Release 4)
REL-5 (Release 5)

Reason for change: ⌘
1. 25.321 is not aligned with 25.301.
2. Some of relations between MAC functions and logical/transport channels are not correct.

Summary of change: ⌘
1. The function 'priority handling between data flows of several users on the DSCH and FACH' is removed from MAC functions. It is not present in 25.301, and it is the same function as 'priority handling between UEs by means of dynamic scheduling'.
2. The function 'Identification of UEs' is marked for the DCCH/DSCH and DTCH/DSCH cases. This function is used when dedicated logical channel is mapped to FACH or DSCH.
3. The title of section 11 is changed from 'Elementary procedures' to 'Specific functions'. The contents of this section are also MAC functions.

Backwards compatibility analysis

The CR shall be backwards compatible since no functionality has changed.

Consequences if not approved: ⌘ Misalignment between the specs.

Clauses affected: ⌘ 6.1, 6.2.1, 6.2.2, 11

Other specs Affected: ⌘
- ☐ Other core specifications ⌘
- ☐ Test specifications
- ☐ O&M Specifications

Other comments: ⌘

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3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

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- Reporting of measurements: Local measurements are reported to RRC.

6 Functions

6.1 Description of the MAC functions

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- mapping between logical channels and transport channels;
- selection of appropriate Transport Format for each Transport Channel depending on instantaneous source rate;
- priority handling between data flows of one UE;
- priority handling between UEs by means of dynamic scheduling;
- ~~priority handling between data flows of several users on the DSCH and FACH;~~
- identification of UEs on common transport channels;
- multiplexing/demultiplexing of ~~higher~~upper layer PDUs into/from transport blocks delivered to/from the physical layer on common transport channels;
- multiplexing/demultiplexing of ~~higher~~upper layer PDUs into/from transport block sets delivered to/from the physical layer on dedicated transport channels;
- traffic volume ~~monitoring~~measurement;
- Transport Channel type switching;
- ciphering for transparent mode RLC;
- Access Service Class selection for RACH and CPCH transmission.

6.2 Relation between MAC Functions and Transport Channels

6.2.1 Relation between MAC Functions and Transport Channels in UTRAN

Table 6.2.1.1: UTRAN MAC functions corresponding to the transport channel

Associated MAC Functions	Logical Ch	Transport Ch	TF Selection	Priority handling between ~~users~~UEs	Priority handling (one ~~user~~UE)	Scheduling	Identification of UEs	Mux/ Demux on common transport channels	Mux/ Demux on dedicated transport channels
Uplink (Rx)	CCCH	RACH						X	
	DCCH	RACH					X	X	
	DCCH	CPCH					X	X	
	DCCH	DCH							X
	DTCH	RACH					X	X	
	DTCH	CPCH					X	X	
	DTCH	DCH							X
	SHCCH	RACH					X	X	
	SHCCH	USCH						X	
	DTCH	USCH	X					X	
	DCCH	USCH	X					X	
Downlink (Tx)	BCCH	BCH				X			
	BCCH	FACH	X			X		X	
	PCCH	PCH	X			X			
	CCCH	FACH	X	X		X		X	
	CTCH	FACH	X			X		X	
	DCCH	FACH	X	X		X	X	X	
	DCCH	DSCH	X	X			X	X	
	DCCH	DCH	X		X				X
	DTCH	FACH	X	X		X	X	X	
	DTCH	DSCH	X	X			X	X	
	DTCH	DCH	X		X				X
	SHCCH	FACH	X	X		X		X	
	SHCCH	DSCH	X	X				X	

6.2.2 Relation of MAC Functions and Transport Channels in UE

Table 6.2.2.1: UE MAC functions corresponding to the transport channel

Associated MAC Functions	Logical Ch	Transport Ch	TF Selection	Priority handling ~~data of~~ (one ~~user~~UE)	Identification	Mux/Demux on common transport channels	Mux/Demux on dedicated transport channels
Uplink (Tx)	CCCH	RACH				X	
	DCCH	RACH	X	X	X	X	
	DCCH	CPCH	X	X	X	X	
	DCCH	DCH	X	X			X
	DTCH	RACH	X	X	X	X	
	DTCH	CPCH	X	X	X	X	
	DTCH	DCH	X	X			X
	SHCCH	RACH				X	
	SHCCH	USCH	X	X		X	
	DCCH	USCH	X	X		X	
	DTCH	USCH	X	X		X	
Downlink (Rx)	BCCH	BCH					
	BCCH	FACH				X	
	PCCH	PCH					
	CCCH	FACH				X	
	CTCH	FACH				X	
	DCCH	FACH			X	X	
	DCCH	DSCH				X	
	DCCH	DCH					X
	DTCH	FACH			X	X	
	DTCH	DSCH				X	
	DTCH	DCH					X
	SHCCH	FACH				X	
	SHCCH	DSCH				X	

11 ~~Elementary procedures~~Specific functions